

NATIONAL RESEARCH COUNCIL
ASSEMBLY OF LIFE SCIENCES

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2101 Constitution Avenue Washington, D. C. 20418

DIVISION OF MEDICAL SCIENCES

COMMITTEE ON DOE RESEARCH ON
HEALTH EFFECTS OF IONIZING RADIATION
PROPOSED AGENDA OF MEETING OF
JANUARY 4, 1979

- 9:00 Opening of meeting-administration of the Committee, charges, bias, and reports, Daniel L. Weiss, NAS
Background of the study, James L. Liverman, DOE
- 10:00 Review of the major research in the field of health effects of low level ionizing radiation being conducted or sponsored by DOE, Eli J. Salmon
- 11:00 Discussion of the tasks of the Committee
- 12:00 Lunch
- 1:00 Continuation of discussion of the tasks of the Committee, definition of scope, and preparation of plan for execution of the study

Proposal for the Review and Evaluation of the Research and Development Program in the Health Effects of Low-Level Radiation of the Department of Energy for the Period August 1, 1978 - July 31, 1979

Program Description

The Acting Assistant Secretary for Environment, Department of Energy (DOE), has requested the National Academy of Sciences (NAS) to review the total research program of the DOE related to the effects of low levels of ionizing radiation on man. A thorough review of the existing programs includes the methodologies being used, the objectivity of the studies, their scientific quality, the Department's methods of peer review, an estimate of the adequacy of financial support, and an evaluation of whether the overall program is adequate to ensure protection of the employees of DOE and their contractors. After the initial review, the NAS is further requested to provide independent advice concerning DOE programs at periodic intervals.

A previous related project of the NAS which has had the support of the DOE or its predecessor agencies, the Energy Research and Development Administration and the Atomic Energy Commission, is the Radiation Effects Research Foundation (former Atomic Bomb Casualty Commission).

Scientific justification: The most debated question and uncertainties regarding the effects on humans of radiation exposure lie in the field of low-level radiation, both as single-dose exposure and in multiple fractionated doses of exposure. The levels in question are those to which workers in radiation plants, the general public in areas of radioactive effluent disposal, and the public receiving medical diagnostic X-rays are exposed. A resolution of the question is necessary in order to establish adequate levels of radiation protection for the workplace and the environment, generally.

The plan for execution of the program will require three stages of study:

Stage I

A steering committee will be appointed with representatives from the breadth of scientific disciplines necessary to accomplish the study. The members of the committee will each serve as chairmen of the site visit teams (vide infra). The steering committee will determine the scope and guidelines which will determine the activities of the site visit teams.

- A group of consultants with the necessary expert knowledge and experience will be convened to make site visit reviews of each major program. The site visit studies will include evaluations of the purpose of the research study, the methodology whereby the study

is undertaken, the quality of the scientific research and the data being produced, and an estimation of the appropriateness of the study and of the level of its financial support. A thorough site report will be prepared for each visit.

- A separate group of consultants with experience in science administration and governmental practices will study the management of health-related scientific programs in the DOE, including evaluation of the method of program selection, peer review, and program management. A detailed report of management practices will be prepared.

Stage II

- The two groups, scientific site visit teams and the management site visit team, will convene together to present their findings collectively. At this time, an overall evaluation of the entire DOE program complex will be developed, with special attention to the question of whether and to what extent the programs meet the charge to the DOE to develop data which will provide a basis for establishing appropriate limits for human exposure to low-level radiation and the attendant question of methods of protection from radiation exposure. Recommendations for future research directions to meet unfulfilled needs for scientific data will be a part of the responsibilities of the study.

Stage III

- Based upon the findings of the study groups, a selected number of experts from appropriate scientific disciplines will be convened to act as a continuing committee to review future and continuing programs of the DOE, advise the DOE on their scientific merit, and recommend new initiatives in research to resolve questions unanswered by current information. This committee may, if appropriate, act as a peer review committee for new programs, although such an activity will not be its primary function. It is contemplated that the committee will continue its activities for several years until the questions of the safety of low-level radiation standards for permissible human exposure are satisfactorily resolved. Costs for the operational aspects of Stage III are not included in the present estimate.

The membership of the committee and of the various site visit teams will be selected for their expert knowledge and experience in the scientific areas under study.

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Purpose of the Committee

- o review and evaluate the quality of the scientific research in the field of the health effects of low-level ionizing radiation being conducted or sponsored by the DOE
- o review and evaluate the scientific management procedures of the DOE, including the method of research program selection, peer review, financial support, methods of program review, and methods of determination of continuance or termination of program
- o determine the relationship between the scientific research program and the management practices of the Department
- o recommend areas of scientific study that need support or discontinuation and methods of science management that would improve the overall DOE program in the health effects of low-level ionizing radiation.

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COMMITTEE ON DOE RESEARCH ON HEALTH EFFECTS OF IONIZING RADIATION

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SUMMARY OF PROJECTS

- A1 - A6 HUMAN HEALTH STUDIES - EFFECT FROM ENERGY GENERATION - METABOLISM AND EFFECTS OF INTERNALLY DEPOSITED RADIONUCLIDES AND TRACE ELEMENTS
- A. F. Stehney, Argonne National Laboratory
- Find quantitative relationships between the biological effects of radionuclides in man and internal radiation doses.
- C & D HUMAN HEALTH EFFECTS FROM ENERGY GENERATION - MEDICAL STUDIES OF THE PEOPLE OF THE MARSHALL ISLANDS ACCIDENTALLY EXPOSED TO FALLOUT
- R. A. Conard, Brookhaven National Laboratory
- Follow-up study of Marshallese exposed to fall-out from nuclear weapons testing.
- E1 DETERMINATION OF PLUTONIUM IN MAN
- G. L. Voelz, M. D., Los Alamos Scientific Laboratory
- Actual measurement of tissue depositions of plutonium in workers to verify the accuracy of estimated body deposition based on bioassay.
- E2 EPIDEMIOLOGIC STUDY OF PLUTONIUM WORKERS
- G. L. Voelz, M. D., Los Alamos Scientific Laboratory
- To establish base-line levels of plutonium in tissues of the general population due to fall-out and in workers as a result of occupational hazard.
- F1 PUBLIC HEALTH AND DEMOGRAPHIC STUDIES
- J. K. Poggenburg, Oak Ridge National Laboratory
- To collect and analyze public health and demographic statistics around existing and proposed nuclear and non-nuclear facilities and to assemble the results for use in assessments.
- F2 DOSIMETRY OF HUMAN EXPOSURES
- D. J. Jacobs, Oak Ridge National Laboratory
- To improve the physical dosimetry of human radiation exposures and the techniques of estimating radiation exposure risks to man.

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- G STATISTICAL HEALTH EFFECT STUDIES
- E. S. Gilbert, Pacific Northwest Laboratories
- To develop and evaluate methods for assessing health effects of chronic low-level exposure to environmental agents, particularly ionizing radiation.
- H1 HEALTH AND MORTALITY STUDY
- C. C. Lushbaugh, Oak Ridge Associated Universities
- To monitor occupational exposures and health experience of workers in industries related to fuel and energy production. Monitoring will be achieved by a mortality study of workers in selected installations associated with nuclear energy.
- H2 DOE/CENTRAL OFFICE FOR DEATH CERTIFICATE RETRIEVAL
- The Central Office for Death Certificate Retrieval provides interaction between all DOE epidemiology programs and the Social Security Administration in order to determine "alive-or-dead" status of individuals enrolled in various research studies.
- I RADIATION EMERGENCY ASSISTANCE CENTER
- C. C. Lushbaugh, Oak Ridge Associated Universities
- To develop medical facilities for training, studying and researching radiation accidents, radiation-treatment problems, etc..
- J DOE HEALTH AND MORTALITY STUDY
- P. A. Fuqua, M. D., Hanford Environmental Health Foundation
- To determine the long-range effect of occupational radiation exposure to man through record collection on dosimetry of Hanford workers.
- K U. S. TRANSURANIUM REGISTRY
- P. A. Fuqua, M. D., Hanford Environmental Health Foundation
- To serve as a center for acquisition and recording of latest and most precise information on the metabolism of the transuranic elements and their effects on man
- L RADIATION EFFECTS RESEARCH FOUNDATION
- L. Allen, Japan
- To detect and define late radiation effects of atomic bomb exposure in the populations of Nagasaki and Hiroshima.

M

DOSIMETRY RECORDS CENTRALIZATION

A. E. Bicker, REECO

To assimilate and organize into central location all existing dosimetry data and historical information relating to personnel exposure resulting from the nuclear weapons testing program.

N

URANIUM MINER LUNG CANCER STUDY

G. Saccomanno, St. Mary's Hospital, Grand Junction, Colo.

To collect medical data from alive and dead uranium miners for lung cancer research. Follow-up of uranium miners in the Colorado Plateau; study of changes in sputum cytology.

O

SOMATIC CELL CHROMOSOME CHANGES IN HUMANS EXPOSED TO ²²²RADON AND ²³⁹PLUTONIUM

W. F. Bandom, University of Denver

To use the cytogenetic data from plutonium workers and uranium miner blood cells to provide a biological indicator of absorbed radiation mutagenic effects; study of chromosome abnormalities in workers in Rocky Flats.

P

THE INFLUENCE OF LATE RADIATION EFFECTS ON IMMUNOLOGIC PARAMETERS OF AGING

Dr. T. Makindan, University of California - Los Angeles

Late radiation effects on various immunologic parameters in Japanese survivors.

Q

INDALO: A STUDY OF PLUTONIUM IN THE ENVIRONMENT - SPAIN

Lawrence Livermore Laboratories

To support the Spanish AEC study of the health and safety aspects of plutonium released into the rural agricultural environment of Palomares, Spain

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MORTALITY FROM LEUKEMIA AND CANCER IN SHIPYARD NUCLEAR WORKERS

T. Najarian, Boston Univ. School of Medicine & T. Colton, Dartmouth Medical School

Study of mortality from leukemia and cancer in shipyard nuclear workers

S1 DOE HEALTH AND MORTALITY STUDY

To determine mortality of all DOE and DOE contractor workers and establish data base for prospective health study of employees and contractors.

S2 MANCUSO HEALTH AND MORTALITY STUDY

T BIOLOGICAL EFFECTS OF IONIZING RADIATION

L. Hempelman, University of Rochester

Project includes medical follow-up of 25 plutonium workers with high depositions

U STUDIES OF POPULATION IN HIGH BACKGROUND AREA

P. Franco, Brazil

Studies of population living in areas of high natural background

V CHEST FLUOROSCOPY AND NEOPLASIA

M. C. Battigelli, University of North Carolina

Incidence of neoplasia in tuberculosis patients subjected to repeated fluoroscopy for pneumothorax and pneumoperitoneum